Dew.

In a late article, we explained some of the functions of the aqueous vapor of the atmosphere. We explained its office in checking evaporation from animal and vegetable organisms; in forming rain, the food, and the vehicle of the food, of plants; in forming snow, nature's blanket for the protection of winter vegetation; and we showed also how water freezing in the soil prevents compactness and agglutination of the soil, and so renders the land light, friable, and mellow, when stirred by the plow in spring.

We notice (5) the function of aqueous vapor in the formation of dew. In discussing this subject, we must strip it of its poetical features. We are not to consider the dew-drops as the fleeting diamonds with which nature bedecks even the grass of the fields, nor as the tears which pitying angels shed upon the sorrowing earth. The subject may be so treated, however, that it will gain in true dignity and importance.

Anybody can make dew at pleasure, and just as nature makes it. When we put ice and water into a pitcher, the outer surface of the vessel is covered at once with drops of water, or dew. There is always aqueous vapor in the atmosphere, and aqueous vapor is water with a certain amount of latent heat in it. When this heat is taken away, the vapor becomes water again. The chilled surface of the pitcher robbing the aqueous vapor of its latent heat, converts the vapor into water. Now, the earth and all objects on its surface are always radiating, or throwing off, heat into free space. During the day the heat received from the sun is greater than the amount lost by radiation. Hence, there is no reduction, but rather an elevation, of temperature. But when the sun sets, the earth continues to lose heat, and receives none. Its temperature, therefore, is reduced, and the aqueous vapor of the atmosphere, coming in contact with the chilled earth, loses its heat, and is condensed and deposited as dew.

Let us notice some of the circumstances that modify the deposit of dew.

(1) The greater the amount of aqueous vapor in the atmosphere, the greater, other things being equal, will be the deposit. When the atmosphere is absolutely saturated with aqueous vapor, that is, holds as much as possible for its temperature, the slightest reduction of temperature is attended with the formation of dew, and if the reduction is considerable, the deposit of dew is correspondingly copious. Hence, not unfrequently, the grass becomes wet even before the sun has set. Hence, also, we find the grass in the morning, when the atmosphere is moist, perfectly drenched with dew, provided the preceding night has been clear and still. On the other hand, in drought, the grass is frequently so dry in the early morning that we may walk in it at will without dimming the polish of our boots.

(2) Another modifying circumstance is the clearness of the heavens. Clouds reflect back the radiant heat and prevent the necessary reduction of temperature. The most oppressive nights in summer are generally cloudy nights. The radiant heat is not thrown off and lost in free space, but is thrown back to the earth by the clouds, and hence the sultry, suffocating feeling we experience on cloudy summer nights. Take a certain weight of wool and lay it on the brass at sunset, and stretch three or four feet above it on uprights a thin piece of cloth. Place near by on the grass, but unprotected, an equal weight of wool, and on each parcel put a thermometer. On examination the next morning at sunrise, the thermometer lying on the unprotected wool will be lower and that parcel will also weigh more than the other. Why? One explanation covers both facts. The unprotected wool radiated, without obstruction, its heat into free space. Hence its temperature was more reduced and the deposit of dew, increasing its weight, was accordingly greater. Hence the practice of gardeners in stretching loose matting, or even extending a board, over tender vegetation when frost is feared. Like the clouds, the contrivances reflect back the ridiant heat, and less reduction of temperature is the result.

(3) For the deposit of dew to be copious the atmosphere must be still. Why? Consider a meadow thickly set in grass. The grass is radiating its heat, as rapidly becoming chilled. If the atmosphere be still, it will also become chilled by contact with the cold grass, and its vapor will be condensed and deposited. But when the atmosphere is in motion, the same stratum of air does not brood over the cold grass long enough to have its temperature sufficiently reduced to condense its vapor. It is for these reasons, that the farmer, particularly the tobacco grower, when threatened by frost—which is but frozen dew—fears the still, clear night. At the close of an anxious day, his fears vanish if clouds appear, or the wind rises. We summarize these points by saying, that for copious deposits of dew, the atmosphere must be humid, still and serene.

(4) There is another matter connected with the formation of dew, which is well calculated to arrest attention. All objects possess different radiating powers, and hence lose heat at night with different rates of facility. Living vegetation radiates heat far more freely than dead vegetation or any form of organic matter. Consequently when the supply of dew is sparse, living vegetation, which needs it gets all or nearly all; dead matter gets none or nearly none. Hence at all is discoverable on the gravel walks, on the plank fences, or ricks of straw. Nature, though prodigal of her gifts, is not the less frugal. When the supply of dew is moderate, she bestows it exclusively on objects that need its life-giving power, and gives it to the objects that need it less only when the supply is large and she can afford to be lavish. What wonderful wisdom is that which has endowed the different forms of matter with the power of wringing water from the invisible atmosphere in exact proportion to their several wants? Can it be other than divine? Somebody else, besides the undevout astronomer, is mad.

According to the foregoing, plants must be chilled in order to obtain the deposit of dew. When the cold is sufficient to freeze the dew, then we have frost and the consequent cessation of vegetable life. The plant, then, must be chilled to obtain the dew it needs, and yet is liable to be killed by the very cause that is necessary to the deposit. To ward off this danger and to protract and invigorate vegetable life, another beautiful and striking provision comes into play. Let us see. We heat a volume of water at such a rate that its temperatue rises, say, 10 degrees per minute. When the temperature reaches 212 degrees, the thermometer placed in the water ceases to rise, but becomes stationary and remains so for 100 minutes, at the end of which time all the water is gone,—is converted into steam. During this 100 minutes, the source of heat being constant, 10 degrees entered every minute, and yet the water and escaping steam stood at 212. What has become of this 1,000 degrees of heat, which has not made the water or the steam hotter, of which the thermometer takes no cognizance? It has been employed in effecting a change of state, converting liquid water into the vapor of water. Urge on the heat as we will after water begins to boil, it gets no hotter. The water is 212, the escaping steam is 212. All this excess of heat is spent in converting a liquid into its vapor, and is called latent heat, because neither our feelings nor the thermometer can detect it. Now, when the vapor of water, becomes water, this latent heat is thrown out and causes an elevation of temperature. Nature performs for us on a grand scale experiments illustrative of this principle. When clouds begin to form, that is when vapor condenses into water, there is always a sensible elevation of the temperature of the atmosphere, due to the evolution of latent heat. In winter the effect is more conspicuous and noticeable than in summer, for reasons which we cannot in this place discuss. The cold, clear days of winter—who cannot recall them! Now, let us apply this doctrine to the subject in hand. When aqueous vapor is condensed as dew upon a plant its latent heat is thrown out and warms up the air immediately over the plant, so that the plant, to get dew, must be chilled, and in getting dew is warmed. In this way, the period of growth and ripening is protracted to a later period in the fall than would otherwise be possible, and the farmer is softly admonished of the approaching advent of winter.

Consider the tobacco field—the broad, bending leaves ripening in the mild September. Those leaves, to become heavy and oily, demand dew. To get dew, they must be chilled; but if chilled too much, they are ruined. As dew is deposited; heat is evolved upon them. What a wondrous plan!

The deposits of dew are most abundant exactly when it is most needed by vegetation. We have copious dew in April and May, September and October, and but little in July and August. In April and May, the seeds are just sprouting, or the roots at most are but an inch or two below the surface. A few hot, windy days would dry the soil to the roots and below, and hence the young plants would die from lack of moisture. Every night, then, nature furnishes the baby plants with pap in the form of dew. The same reasoning applies exactly to September and October, when wheat and other vegetation, that are to live through the winter, are trying to get hold and become securely anchored before cold weather sets in. But, in July and August, the roots have struck down six, twelve, eighteen inches, to the the region of permanent moisture. They can live and thrive for weeks now without rain; for moisture is stored away in the earth for their use between the rains, and they are, to a large extent, independent of the dew. They get but little dew; they need but little.

The philosophy of dew-formation explains clearly why dew is most abundant exactly when it is most needed. In May or September, the days are shorter and cooler than in July. The earth at sunset in these two months, is many degrees cooler than at sunset in midsummer. To sink to the dew-point, therefore, it has to radiate into space less heat and has, in the comparatively long night, more time to do it in. We have, therefore, the heaviest deposits of dew in the spring and fall, when it is most needed because then less work is necessary to produce the deposit and more time is allowed in the long nights for doing the work.

Can we, to any extent, control the deposit of dew? Unquestionably, we can. When land is deeply plowed, the air, striking down as far as the soil is loosened, comes into contact with earth cool enough to condense aqueous vapor. Thus dew may be copiously deposited deep down among the rootlets of plants, where it is most needed, though none may be seen on the surface of the earth. The earth is a very feeble conductor of heat, and hence is much cooler, in summer, ten or twelve inces below than at the surface. The more deeply land is plowed, therefore, the more freely is air admitted into the deep soil, where its aqueous vapor is condensed among the rootlets, and left behind in the form of dew.—*Religious Herald.*

A RIVER OF FIRE.

Scenes at Mauna Loa, the Hawaiin Volcano, Described.

Hawaiian advices to the 9th inst. are received by the China merchant steamer Ho Chung to-day. The *Gazette* gives additional particulars about the great eruption of Mauna Loa. It says: "The view from Hilo of that outbreak upon Mauna Loa has shown some remarkable changes during the past week. The flow toward Kau is diminishing. Parties returned from Kilauea report that the stream is flowing very slowly and, as seen from the Valcano House, is losing its fire day by day. Kilauea, however, is exceedingly active, presenting unusual attractions. The most active flow now is that running from near the summit of Mauna Loa in a northerly direction, or towards Mauna Kea. Clouds for the greater portion of the time have obscured the mountains, lighting, however, at intervals to reveal the sul lime fires still doing their awful work. Saturday evening, November 20, was very clear, and an eruption was observed in three distinct craters, with a great flow of molten lava running from one to another, and one down the sides of the mountain to the north, apparently. Parties watching the mountain from Hilo just at dusk noticed a sudden eruption or explosion from one of these craters. An immense amount of material was suddenly thrown several hundred feet into the air. Wednesday evening, November 4, was also very clear, and the pyrotecnic display, which was very magnificent, could be admired by all beholders. On Thursday morning the mountain was clear for an hour, and revealed through the glare that the configuration of the dome-like surface of Mauna Loa is much changed. Two crater-mounds of considerable height breaks its even front, lying apparently two or three miles apart. The second is northwest of the first. A third crater, at a little greater distance and north of the second, was also observed, and in all three there seems to be great activity. At times during the night the clouds cleared away, revealing columns of fire and smoke, not only pouring from the three great centres of activity, but from the whole line. Several parties have gone to the scene of action, and those who have returned speak of the flow as awful beyond description, rolling, grinding and burning its terrible way with irresistible force." Just before the departure of the steamer a heavy column of smoke and flame on the line of the advance seemed to indicate that the flow is in the Hilo woods. A correspondent from the field writes as follows: "Lava has flowed about twenty-five miles toward Hilo, and is now in the neighborhood of twenty miles away. It is from a quarter to a half mile wide at the upper part of its course, and from three-quarters to a mile wide at the lower end. It has entered the woods on one side, and as it rises high, about fifty-five feet, which is specially high at this point, its front looks threatening, though I did not see any portion of it in motion at the lower end, but conclude that the motion was at the centre and of rotary nature, rolling the masses of lava and click stones to either side in great piles. As it rushed along, increased activity at the fountain head could be plainly detected along the line of the flow by the increased number of steam holes and the escaping smoke. I saw no trees burning, though the steam had advanced into the upper woods."

—The Dublin correspondent of the London *Times* says; "A more repulsive and terrible year has never come upon the country. Its history may be written in two words—'Distress and Disturbance.' It came in with the begging-box, and has gone out with the bludgeon. It will take many years to reconstruct the social system now in ruins, and few can be sanguine enough to hope the task will be accomplished in the present generation."

—"Go where there is the most sin, sir," said the old clergyman's coachman, when asked which of two calls the dominie ought to accept. The good man thought over it, and concluded that where there was most money there would be the most sin. So he accepted the call which offered him the most substantial salary.

Origin of the Confederate Battle Flag.

The facts concerning the origin of the battle flag contained in this article are derived from a speech by General Beauregard before a special meeting of Louisiana Division, Army Northern Virginia Association, December 6, 1873.

This banner, the witness and inspiration of many victories, which was proudly borne on every field from Manassas to Appomattox, was conceived on the field of battle—and on the last fatal field ceased to have place or meaning in the world.

But the men who followed it and the world which watched its proud advance or defiant stand, see in it still the unstained banner of the brave whose final defeat but added lustre to their grandest vicories.

It not the flag of the Confederacy, but simply the banner—the battle flag—was of the Confederate soldier. As such it should not share in the condemnation which our *cause* received, or suffer from its downfall. The whole world can unite in a chorus of praise to the gallantry of the men who followed where this banner led.

It was at the battle of Manassas, about 4 o'clock of the afternoon of the 21st of July, 1861, when the fate of the Confederacy seemed trembling in the balance, that General Beauregard, looking across the Warrenton turnpike, which passed through the valley between the position of the Confederate and the elevation beyond occupied by the Federal line, saw a body of troops moving towards his left and the Federal right. He was greatly concerned to know, but could not decide. what troops they were—whether Federal or Confederate. The similarity of uniform and of colors carried by the opposing armies, and the clouds of dust, made it almost impossible to decide.

Shortly before this time General Beauregard had received from the signal officer, Captain Alexander, a dispatch saying that from the signal station in the rear he has sighted the colors of this column, drooping and covered with the dust of journeyings, but could not tell whether they were the stars and stripes or the stars and bars. He thought, however, that they were probably Patterson's troops arriving on the field and reinforcing the enemy.

General Beauregard was momentarily expecting help from the right, and the uncertainty and anxiety of this hour amounted to anguish. Still the column pressed on. Calling a staff officer, General Beauregard instructed him to go at once to General Johnston, at the Lewis House, and say that the enemy were receiving heavy reinforcements, that the troops on the plateau were very much scattered, and that he would be compelled to retire to the Lewis House and there reform—hoping that the troops ordered up from the right would arrive in time to enable him to establish and hold the new line.

Meanwhile, the unknown troops were pressing on. The day was sultry, and only at long intervals were there the slighest breeze. The colors of the mysterious column hung drooping on the staff. General Beauregard tried again and again to decide what colors they carried. He used his glass repeatedly, and handing it to others begged them to look, hoping that their eyes might be keener than his.

General Beauregard was in a state of great anxiety, but finally determined to hold his ground, relying on the promised help from the right, knowing that if it arrived in time victory might be secured, but feeling also that if the mysterious column should be Federal troops the day was lost.

Suddenly a puff of wind spread the colors to the breeze. It was the Confederate flag—the stars and bars! It was Early with the Twenty-fouth Virginia, the Seventh Lousiana, and the Thirteenth Mississippi. The column had by this time reached the extreme right of the Federal lines. The moment the flag was recognized Beauregard turned to his staff right and left, saying, "See that the day is ours!" and ordered an immediate advance. In the meantime Early's brigade deployed into line and charged the enemy's right—Elzy, also, dashed upon the field—and in one hour not an enemy was to be seen South of Bull Run.

While on this field and suffering this terrible anxiety, General Beauregard determined that the Confederate soldier must have a flag so distinct from that of the enemy that no doubt should ever again endanger his cause on the field of battle.

Soon after the battle he entered into correspondence with Colonel William Porcher Miles, who had served on his staff during this day, with a view to securing his aid in the matter, and proposing a blue field, red bars, crossed, and gold stars.

They discussed the matter at length. Colonel Miles thought it was contrary to the law of heraldry that the ground should be blue, the bars red, and the stars gold. He proposed that the ground should be red, the bars blue, and the stars white.

General Beauregard approved the change, and discussed the matter freely with General Johnston. Meanwhile it became known that the design for a flag was under discussion, and many designs were sent in. One came from Mississippi; one from J. B. Walton and E. C. Hancock, which coincided with the design of Colonel Miles. The matter was freely discussed at headquarters, till finally, when he arrived at Fairfax Court House, General Beauregard caused his draughtsman (a German) to make drawings of all the various designs which had been submitted. With these designs before them the officers at headquarters agreed on the famous old banner—the red field, the blue cross, and the white stars. The flag was then submitted to the War Department, and was approved.

The first flags sent to the army were presented to the troops by General Beauregard in person, he then expressing the hope and confidence that it would become the emblem of honor and victory.

The first three flags received were made from "*Ladies' dresses*" by the Misses Carey, of Baltimore and Alexandria, at their residences and the residences of friends, as soon as they could get a description of the design adopted. One of the Misses Carey sent the flag she made to General Beauregard. Her sister sent hers to General Van Dorn, who was then at Fairfax Court House. Miss Constance Carey, of Alexandria, sent hers to General Joseph E. Johnston.

General Beauregard sent the flag he received at once to New Orleans for safe keeping. After the fall of New Orleans Mrs. Beauregard sent the flag by a Spanish man of war, then lying in the river opposite New Orleans, to Cuba, where it remained till the close of the war, when it was returned to General Beauregard, who presented it for safe keeping to the Washington Artillery, of New Orleans.

This article is penned to accomplish, if possible, two things: first, to preserve the little history connected with the origin of the flag; and, second, to place the battle flag in a place of security, as it were, separated from all the political significance which attaches to the Confederate flag, and depending for its future place solely upon the deeds of the armies which bore it amid hardships untold to many victories.—*Carlton McCarthy in Southern Historical Society Papers.*

—A Berlin dispatch says: "On the morning of New Year's Day large crowds, mostly composed of students, made a demonstration before a cafe, much frequented by Jews. They smashed the windows and mobbed all the Jews they met. The police were comparatively helpless. Large and stormy meetings continue to be held, and the crusade seems to be gaining force, the fist now being substituted for the tongue."

—There was appropriated for the payment of pensions for the current fiscal year over $56,000,000, of which large sum nearly $27,000,000, being about one-half of the amount of appropriation, was on account of the arrearage act. It now appears that the extraordinary sum above named is not sufficient to meet the requirements for pensions for the current fiscal year, and that at least $18,000,000 or $20,000,000 additional will have to be appropriated at the present session of Congress to meet the anticipated deficiency. The Commissioner of Pensions has recently settled and allowed claims for Pensions aggregating $3,000,000, and checks for that amount have been mailed from the treasury. The disbursement of this sum will nearly exhaust the entire amount appropriated for pensions for the current fiscal year, and make necessary a deficiency appropriation in order to provide for the quarterly payment due in March next. The large reduction of the annual expenditures secured in the interest account by reason of refunding the public debt into 4 per cent. bonds, will be more than counterbalanced by the enormous increase occasioned by the arrearage pension act; and, large as this increase is on this account, it has not yet reached the maximum.

—There is a curious case of filial devotion in Kansas. And old Topeka grocer was murdered in 1874, and a fast young man named Fred. Olds was suspected and arrested. He pleaded guilty, was convicted of murder in the first degree, and was sentenced to imprisonment for life, as the law never hangs a man in Kansas. Ever since then Olds has been faithfully serving in prison with exemplary behavior. His father recently committed suicide, nobody knew why, and now Old publishes a statement saying that his father was the real murderer, and averring his own innocence. The confession gives the minutest particulars of the murder, many minor points agreeing with the facts developed in the evidence at the trial. He says his father did the murder while drunk, and that he convicted himself to shield his parent. He says his father said: "If we stood trial, both would be found guilty and sent to the penitentiary for life." He then said if I would plead guilty and swear that I killed the man in a quarrel, and then no one knew anything about it, that it would clear him, and that he could get me out of prison in two or three years on account of my age. My mother afterward made efforts to secure a pardon for me, and when I wrote to my father of her failure, he committed suicide in one month from that time. The statement explains many discrepancies that were without weight at the trial because of the plea of guilty, and it is generally believed to be true. The Governor of Kansas is considering what he can do for Olds

Greenville and Columbia Railroad.
CHANGE OF SCHEDULE.

On and after Monday, Nov. 8, 1880, the passenger Trains over the Greenville and Columbia Railroad will be run daily, Sundays excepted:

UP.

Leave Columbia at	11 25 a m
Leave Alston	11 45 p m
Leave Newberry	1 30 p m
Leave Hodges	3 58 p m
Leave Belton	5 11 p m
Arrive at Greenville	6 29 p m

DOWN.

Leave Greenville at	10 55 a m
Leave Belton	12 15 p m
Leave Hodges	1 30 p m
Leave Newberry	4 11 p m
Leave Alston	5 09 p m
Arrive at Columbia	6 15 p m

ANDERSON BRANCH & BLUE RIDGE R. R.

UP.

Leave Belton	5 12 p m
Leave Anderson	5 52 p m
Leave Pendleton	6 34 p m
Leave Perryville	7 05 p m
Leave Seneca City	7 32 p m
Arrive at Walhalla	8 03 p m

DOWN.

Leave Walhalla	9 25 a m
Leave Seneca	10 01 a m
Leave Perryville	10 13 a m
Leave Pendleton	10 40 a m
Leave Anderson	11 24 a m
Arrive at Belton	12 03 a m

EXTRA TRAIN FROM BELTON TO ANDERSON—DAILY.

UP.

Leave Belton	12.40 p. m
Arrive at Anderson	1.13 p. m

DOWN.

Leave Anderson	4.25 p. m
Arrive at Belton	5.00 p. m

J. W. FRY, Gen. Supt.
A. POPE, Gen. Ticket Agent.